

Remarks

Claims 1-4 and 7-11 are pending in the subject application. By this amendment, claim 1 has been amended. Upon entry of this amendment, claims 1-4 and 7-11 will be before the Examiner. Favorable consideration of the pending claims is respectfully requested in view of the following remarks.

An executed Declaration Under 37 CFR §1.132 by Jong-chul Lim is submitted with this Amendment.

Claims 1-4 and 7-11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Scott (U.S. Patent 6,627,524) in view of Pradeep *et al.* (U.S. Patent 5,866,448) or Zhou *et al.* (U.S. Patent 5,858,847). Applicant respectfully traverses, noting that a *prima facie* case of obviousness has not been presented. Three criteria must be met to establish *prima facie* case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art reference, or combination of references, must teach or suggest all the claim limitations.

Claim 1 has been amended to recite “wherein patterning the sacrificial layer to form polymer layers on sidewalls of the sacrificial layer comprises: forming a photoresist pattern on the sacrificial layer, and etching a portion of the sacrificial layer through the photoresist pattern,” in order to clarify that patterning the sacrificial layer to form polymer layers on sidewalls of the sacrificial layer is accomplished by a patterning step and an etching step. Support for this amendment can be found, at least, at paragraphs [0009] and [0010]. No new matter has been introduced by this amendment.

The Office Action at page 3 states that in view of Pradeep *et al.* and Zhou *et al.* “it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Scott so as to form the polymer layers by etching the sacrificial layer because this would reduce the overall number of process steps, thereby decreasing process time.”

However, referring to page 2, first full paragraph of Lim’s Declaration, Lim states,

“First, there is no suggestion or motivation that the photoresist of Scott should be replaced with the silicon oxide layer of Pradeep *et al.* or a hard mask layer of Zhou *et al.*, formed using a Tetraethylorthosilicate (TEOS) process. In particular, Pradeep *et al.* discloses a process for forming a lightly doped-drain (LDD) structure where the forming of a polymer sidewall provides the advantage, as described at col. 3, lines

34-36, "that the sidewall oxide deposition onto the silicon active area is eliminated, thereby reducing the risk of channel contamination." This sidewall oxide deposition described in Pradeep *et al.* is not present as a problem in Scott. Zhou *et al.* also discloses a process for forming a LDD structure. Zhou *et al.* describes the need to provide, as stated at col. 3, lines 28-33, "a simpler method of forming the lightly doped drain structure that eliminates the process steps of spacer oxide deposition and spacer etch . . . [t]he width of the polymer layer and the lightly doped drain is highly controllable and can be formed thinner than traditional dielectric and photoresist spacers." Again, spacer oxide deposition and etch are not present as a problem in Scott. Therefore, neither Pradeep *et al.* nor Zhou *et al.* provide motivation to modify Scott to arrive at the claimed invention."

In addition, referring to page 3 of Lim's Declaration, beginning at the bottom of the page, Lim states that

"there is no motivation to replace the photoresist layer of Scott with a sacrificial layer of the material discussed in Pradeep *et al.* or Zhou *et al.* because the function of the photoresist layer of Scott does not necessitate a polymer generating characteristic. The photoresist layer of Scott is capable of bonding with a specified coating layer. This coating layer can easily be removed from the areas that have not bonded with the photoresist. (See col. 3, line 48 – col. 4, line38)."

As spacer oxide deposition and etch is not present as a problem in Scott, and because the function of the photoresist layer of Scott does not necessitate a polymer generating characteristic, the cited references, alone or in combination do not teach or suggest the invention as claimed in claims 1-4 and 7-11.

Moreover, the Office Action fails to indicate how modifying Scott in view of Pradeep *et al.* and Zhou *et al.* actually reduces the number of process steps. In particular, referring to page 2 of Lim's Declaration, beginning at the bottom of the page, Lim states,

"the method claimed in claim 1 of the subject application does not necessarily reduce the overall number of process steps in Scott. In particular, Scott provides a method of forming at least two programmable read-only memory constructions including the steps of:

1. forming at least one conductive material over a semiconductor substrate;

2. forming at least two patterned photoresist blocks over the conductive material, with a pair of adjacent photoresist blocks being separated by a first gap;
3. forming a coating over the pair of adjacent photoresist blocks and across the first gap between the adjacent blocks;
4. selectively removing the coating from across the first gap while leaving the coating on the pair of adjacent photoresist blocks such that the pair of photoresist blocks and coating remaining on the pair of photoresist blocks define a pair of masking blocks that are separated by a second gap where the second gap is narrower than the first gap
5. using this pattern to etch a pair of spaced floating gate constructions from the conductive material.

(See col. 2, lines 11-24)

Comparing with the method as claimed in claim 1 of:

1. forming an oxide layer and a polysilicon layer on the substrate;
2. forming a sacrificial layer on the polysilicon layer;
3. forming a photoresist pattern on the sacrificial layer;
4. etching a portion of the sacrificial layer through the photoresist pattern, the polymer layers being generated from the etching of the sacrificial layer;
5. forming a floating gate and a tunnel oxide using the sacrificial layer and the polymer layers as an etching mask.

It is apparent that on its face, exchanging steps 2, 3, and 4 of Scott with the listed 2, 3, and 4 of subject claim 1 does not reduce the number of steps."

Accordingly there is no motivation in Scott to exchange (1) forming photoresist blocks, (2) forming a coating over the photoresist blocks, and (3) selectively removing the coating across the gap while leaving the coating on the photoresist blocks for (1) forming a sacrificial layer on the substrate, (2) forming a photoresist pattern on the sacrificial layer, and (3) etching the sacrificial layer as claimed in subject claim 1.

The law is clear that using one's application as a guide for hindsight reconstruction of the invention is improper. Combining steps from various references to modify them merely because they can be combined is not enough. To provide a *prima facie* case of obviousness, one must find

the motivation to modify the teachings in the prior art, not in Applicant's specification. Scott does not drive the ordinary artisan to seek modification, and neither Pradeep *et al.* nor Zhou *et al.* provide motivation to modify Scott to arrive at the subject invention as claimed.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 1-4 and 7-11 under 35 U.S.C. § 103(a).

In view of the foregoing, Applicant believes that the currently pending claims are in condition for allowance, and such action is respectfully requested.

The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§ 1.16 or 1.17 as required by this paper to Deposit Account 19-0065.

The applicant invites the Examiner to call the undersigned if clarification is needed on any of this response, or if the Examiner believes a telephonic interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,



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Attachments: Request for Continued Examination including Petition and Fee for Extension of Time;  
Declaration of Jong-chul Lim.